# THE FRANKLIN INSTITUTE

## COMMITTEE ON SCIENCE AND THE ARTS

*No.* 2903
2904

*Subject* Franklin Medal

*Applicant*

*Address*

*Date of Application*

*Inventor*

*Address*

*COMMITTEE:*

Doctor James Barnes *Chairman*

Mr. Charles E. Bonine

Mr. G. H. Clamer

Doctor H. J. M. Creighton

Mr. Benjamin Franklin

*MEETINGS:*

November 21, 1928

December 12, 1928

*Report presented to General Committee:*

January 2, 1929

*Award* of Franklin Medals

*to* Mr. Emile Berliner and
Dr. C. T. R. Wilson

*Final Action:*

February 6, 1929

~~*Report sent to Inventor*~~

Mr. Berliner was present and received his award
Sir Esme Howard, British Ambassador, received
the award for Dr. Wilson - May 15, 1929.

THE FRANKLIN INSTITUTE OF THE STATE OF PENNSYLVANIA

For the Promotion of the Mechanic Arts

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Committee on Science and the

Arts Cases No. 2903 and 2904.

Hall of the Committee,

Philadelphia, January 2, 1929.

Report of Sub-Committee on Awarding The Franklin Medal.

Sub-Committee: Doctor James Barnes, Chairman

Mr. Charles E. Bonine

Mr. G. H. Clamer

Doctor H. J. M. Creighton

Mr. Benjamin Franklin

To the Committee on Science and the Arts:

Your Sub-Committee has considered with care those workers in physical science or technology, not previously recognized by the award of The Franklin Medal, who have contributed greatly to the advancement of science.

The members of your Standing Committee are unanimously of the opinion that two Franklin Medals should again be struck and awarded this year, one to Emile Berliner, Inventor, of Washington D. C.,

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In recognition of a life-work in successful invention: the discovery of the electrical characteristics of the loose contact and application of them to telephony in the microphone, which he originated; development of the talking machine which uses a disc upon which the sound is recorded by a laterally cut groove; and, in recent years, his contributions to the production of proper acoustical qualities in architectural structures;

and the other medal to Doctor Charles Thomson Rees Wilson, Jacksonian Professor of Natural Philosophy, Cambridge University, England,

In recognition of his numerous pioneer contributions to atomic physics, especially for his studies of condensation nuclei and his development of a method of photographing their tracks and for the vital importance of these studies to our knowledge of atomic structure and quantum mechanics.

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EMILE BERLINER

Emile Berliner was born at Hanover, Germany, on May 20, 1851. He received his education at the Samson School in Wolfenbuttel from which he was graduated in 1865 and came to the United States five years later. His interest in science led him to make a study of the work of those inventors who were investigating the application of the electric current in the field of the mechanical recording and electrical transmission of human speech.

In this study he became familiar with the ideas and practical applications of such men as Charles Bourseuil who first, in 1854, advanced

the idea that "two diaphragms, one operating an electric contact and the other under the influence of an electro-magnet, might be employed for transmitting speech over telegraphic distances"; Leon Scott, the inventor of the phonautograph for the recording of sound vibrations in 1857; and Charles Cros who first suggested the idea of mechanically reproducing speech and a feasible plan for such reproduction. This idea and plan were contained in a sealed communication which he deposited with the Academy of Sciences in Paris on April, 1877.

These pioneers in the idea were soon followed by otherslike Bell, Tainter and Edison.

In 1877 Mr. Berliner discovered that a loose contact will act as a telephone transmitter and from this discovery he developed the microphone. He was the first to make use of induction coils in connection with transmitters, an invention on which he was granted a patent in 1878.

His study of existing machines for the reproduction of speech led to his invention of the gramophone which differed from other devices for that purpose in regard to the character of the groove in which the needle of the reproducing device moves. This groove is of uniform depth, the sound vibrations being registered laterally so that the curves are in a plane parallel to that of the surface of the disk instead of being in a direction perpendicular to that surface.

This machine is known as the Victor Talking Machine and is one of the most satisfactory machines for the reproduction of the human voice now on the market. Mr. Berliner also developed and perfected a method by means of which the disks can be duplicated in permanent form.

In 1908 he was the first to have made and used, in aeronautical

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experiments, light weight revolving cylinder internal combustion motors now used on airplanes and has been interested in the development of helicopters.

In 1925 he invented the acoustic tile and acoustic cells for insuring good acoustics in auditoriums. These have been applied for improving the acoustics in halls in which the hearing was notably bad and the results have been satisfactory.

Since 1901 Mr. Berliner has been engaged in an educational campaign against the dangers to health in the use of raw milk and other dairy products.

C. T. R. WILSON

Professor C. T. R. Wilson, M.A., B.Sc., LL.D. (Aberdeen), Fellow of Royal Society, Fellow of Sydney Sussex College and Nobel Laureate (1927), was born the 14th of February, 1869 at Glencorse, Scotland.

He discovered that when air which is saturated with water vapor is ionized by x-rays and then suddenly cooled by an expansion, a smaller expansion is required to make a cloud form about the negative than about the positive ions. It was this discovery that enabled Sir J. J. Thomson to determine that important scientific constant, the charge on the electron.

He was the first to develop a method for exhibiting many of the properties of electrons, ions and x-rays by photographing their tracks through super-saturated water vapor. Some of the photographs showed a sharp deviation of $\beta$-particles through large angles up to 180°. These are due to the close approach of the $\beta$-particle to the nucleus of an atom. It was these observations together with the results of the scattering of x-rays in passing through thin metallic films that led Sir Ernest Rutherford to suggest his theory of atomic

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structure - a theory which to date is the one giving the greatest satisfaction. The photographs also showed that short range electrons were ejected by x-rays nearly along the direction of the primary ray. Their direction and range and the value of the minimum frequency of the radiation which is required to produce them are in agreement with the suggestion of A. H. Compton that a single electron may be effective in scattering a quantity of radiation and in so doing obeys the laws of quantum mechanics.

Professor Wilson has also contributed valuable observations on atmospheric electricity.

The following is a list of the more important papers published by him:


Proceedings of the Royal Society

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| The Effect of Röntgen Rays on Cloudy Condensation | - Vol. 59 - p. 338 |
| Condensation of Water Vapour in the Presence of Dust-Free Air and Other Gases. | - Vol. 61 - p. 240 |
| On the Condensation Nuclei Produced in Gases by the Action of Röntgen Rays, Uranium Rays, Ultra-Violet Light and Other Agents. | - Vol. 64 - p. 127 |
| On the Comparative Efficiency as Condensation Nuclei of Positively and Negatively Charged Ions | - Vol. 65 - p. 289 |
| On the Ionization of Atmospheric Air | - Vol. 68 - p. 151 |
| On the Spontaneous ionization of Gases | - Vol. 69 - p. 277 |
| On the measurements of the Atmospheric Electric Potential Gradients and the Earth-Air Current | - Vol. 80 - p. 537 |
| On Some Determinations of the Sign and Magnitude of Electric Discharges in Lightning Flashes | - Vol.102 - p. 555 |
| On an Expansion Apparatus for Making Visible the Tracks of Ionizing Particles in Gases and Some Results Obtained by its Use | - Vol. 87 - p. 277 |
| On a Method of Making Visible the Paths of Ionizing Particles through a Gas. | - Vol. 85 - p. 285 |
| Investigations on X-rays and $\beta$- rays by the Cloud Method | - Vol.104 - p. 1 and 192 |

And in other journals

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| Investigations of Lightning Discharges and on the Electric Fields of Thunderstorms | - Vol. 221 - p. 73 Phil. Trans. Roy. Soc. |


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On the Theory of Thunderstorm Electricity - Vol. 17 - p. 634 Phil. Mag.

On the Condensation Method of Demonstrating the Ionization of Air under Normal Conditions. - Vol. 7, p. 681 Phil. Mag.

Respectfully submitted,

James Barnes
Chairman.

Benj. Franklin

Charles E. Bonine

H. Semmes Creighton